

COLD ROLLED STEEL SHEET HAVING AGING RESISTANCE AND SUPERIOR
FORMABILITY, AND PROCESS FOR PRODUCING THE SAME

Abstract of the Disclosure

A cold rolled steel sheet, and a method of manufacturing the same, designed to have aging resistance and excellent formability suitable for use in automobile bodies, electronic appliances, and the like. The cold rolled steel sheet comprises in weight %: 0.003 % or less of C, 0.003 ~ 0.03 % of S, 0.01 ~ 0.1 % of Al, 0.02 % or less of N, 0.2 % or less of P, at least one of 0.03 ~ 0.2 % of Mn and 0.005 ~ 0.2 % of Cu, and a balance of Fe and other unavoidable impurities. When the steel sheet comprises one of Mn and Cu, the composition of Mn, Cu, and S satisfies at least one relationship: $0.58 \cdot \text{Mn}/\text{S} \leq 10$ and $1 \leq 0.5 \cdot \text{Cu}/\text{S} \leq 10$, and when the steel sheet comprises both Mn and Cu, the composition of Mn, Cu, and S satisfies the relationship: $\text{Mn} + \text{Cu} \leq 0.3$ and $2 \leq 0.5 \cdot (\text{Mn} + \text{Cu})/\text{S} \leq 20$. Participates of MnS, CuS, and (Mn, Cu)S in the steel sheet have an average size of $0.2 \mu\text{m}$ or less. Since carbon content in a solid solution state in a crystal grain is controlled by fine precipitates of MnS, CuS, or (Mn, Cu)S, the steel sheet has enhanced aging resistance and formability, and has excellent yield strength and strength-ductility.